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1985
STATISTICAL REVIEW

Annual Market Study of the Telecommunications Equipment Industry by North American Telecommunications Association

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SCOPE AND METHOD

The *1985 Telecommunications Equipment Industry Statistical Review* is designed to provide a comprehensive, current overview of the business telephone equipment market in the United States. Its findings are drawn from the best data available and assumptions grounded in trends and developments as reported by a wide range of industry participants. The market analysis rests on quantitative estimates of:

- Manufacturers' annual shipments of PBX and key telephone equipment, measured in both equipment volume and revenues.
- Vendor sales of new equipment to end users, measured both in equipment volumes and revenues.
- Vendors' installed base of equipment, which refers to the cumulative total of telephone equipment in-use on customers' premises. A subcategory of AT&T's installed base, referred to as its embedded base, includes all of the in-place telephone equipment transferred from the Bell operating companies to AT&T upon divestiture.

The market profiled in the *1985 Review* differs significantly from prior projections. All previous appraisals of trends and probable developments in the telecommunications industry were necessarily revised because the years 1983 and 1984 were among the most chaotic in the history of the independent telephone equipment industry. Reasons these years were uniquely problematic for analysts include: the temporary absence of the BOCs from equipment markets in 1983 due to deregulation of the CPE markets and divestiture of the local Bell operating companies from AT&T; the transfer of the embedded base of Bell equipment from the BOCs to AT&T; the loss of traditional data sources at the FCC; a huge influx of new companies into the market, at both the manufacturer and vendor levels; and market conditions characterized by destructive price wars, cutthroat competition, and general confusion.

NATA's research department has spent the better part of the year reviewing primary sources of data, developing new techniques for developing estimates, and reviewing all recent projections. These efforts have led to substantive revisions in four areas of this year's *Review*: reduction of the independent telephone companies' installed base of key telephone equipment; revision of the distribution of both the key and PBX installed base for 1983; recompilation of all Centrex estimates from primary sources; and revision of the level of interconnect industry sales and revenues to accurately reflect the other adjustments.

NATA's major source for this study has been an extensive informal survey of industry participants to identify and track current trends and issues. NATA researchers also have reviewed a wide range of industry studies and consulted many independent analysts to ensure that no significant aspects of the industry were overlooked. Though these sources were extremely helpful, the data and assumptions in this *Review* are entirely those of NATA.

David Keeler
Manager, Market Research
October 1985

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INDUSTRY OUTLOOK

The Restructured Market

The years 1983–1984 brought large-scale, dramatic changes in the structure of the U.S. competitive telecommunications marketplace. Two major shifts in public policy—the federal deregulation of customer premises equipment (CPE)* together with the court-ordered breakup of the integrated Bell System—significantly altered the roles of many of the largest firms in the CPE marketplace. These changes briefly boosted the interconnect industry**, which was able to exploit the temporary market disruptions and turn them into sizeable market gains. During this period, the Bell operating companies (BOCs) were temporarily excluded from the CPE market; AT&T shifted its equipment sales to its separate subsidiary AT&T Information Systems (AT&T-IS); and all leased Bell equipment was shifted to AT&T-IS following diverstiture.

As the new market order began to take shape in 1984, however, interconnect firms still found themselves faced with a host of challenges—some novel, but some long familiar. Independent suppliers continue to encounter the problem of competing against the BOCs which are able to manipulate competitive market conditions, most dramatically through the pricing of Centrex services. Independent vendors also face new problems associated with an increasingly overcrowded marketplace, problems such as a continuing price war and depressed profit margins.

Despite steady, albeit slow, growth in CPE markets as a whole, interconnect dealers will account for a declining share of annual CPE sales through the end of the decade. With these declines, the process of market consolidation, which began in earnest the first half of 1985, will continue at least into 1987, reducing the number of independent interconnect dealers drastically. Thanks only to increased emphasis on service-related and other secondary revenue sources will overall interconnect revenues remain essentially flat. By contrast, the BOCs and AT&T over the same period will enjoy steadily rising shares of annual CPE sales and together account for almost 60 percent of all CPE sales in 1989.

Interconnect Vendors

Interconnect firms experienced phenomenal success in 1983, capturing 64 percent of total industry sales during the disjointed implementation of deregulation and divestiture. Prior to their separation from AT&T, the BOCs in 1983 were temporarily barred from offering new CPE. Moreover, AT&T's new unregulated equipment subsidiary, AT&T-IS, was in the throes of one of the largest corporate reorganizations in U.S. history. With the benefit of these unique opportunities, independent vendors in 1983 achieved record sales volumes and market shares.

But 1984—while a strong year by any standards for independent CPE vendors—also marked the beginning of a period of retrenchment. As AT&T and the individual BOCs developed strong sales and service organizations, they began to reclaim their historical positions of market dominance. And interconnect companies found themselves fighting hard to maintain their gains from the previous year. Interconnect companies' share of CPE markets slipped to an estimated 53 percent in 1984 and is expected to decline to 45 percent in 1985. After a brief respite, independent vendors once again have found themselves in a battle with giants.

In addition to facing renewed competition from AT&T and the BOCs, veteran interconnect companies in 1983–1984 were deluged by new competitors. Hundreds of new vendors, lured by competitive opportunities unfolding in the wake of divestiture, began to fight for a place in the market in 1983 and 1984. Unfortunately, divestiture did not so much drum up new market demand as reshape existing distribution channels. Consequently, new vendors soon found themselves competing against each other and more established interconnects for a declining share of the market. The result was a spiraling price war and ever-decreasing profits for the survivors. Companies without solid capitalization and coherent strategies for generating nonsales revenues were forced out of the market.

*Mandated by the Federal Communication Commission's (FCC's) 1980 *Computer II* ruling.
**All nontelco business-CPE suppliers who are not affiliated with AT&T or the BOCs.

Currently, the interconnect industry is undergoing both consolidation and retrenchment. The number of competing companies will likely decline over the next two to three years, with the probable survivors being the best managed firms, those with the clearest vision for exploiting the continuing shift to office automation, and those satisfied with pursuing a geographic or technological niche. Survivors will have to reevaluate their roles in the marketplace and transform their companies from sales-driven to service-based operations. The most successful interconnects in the late 1980s also will have to learn how to expand their product lines to keep pace with the burgeoning data services market. Though the CPE market will stabilize over the next few years, it will not return to the high-growth, more reasonable profit conditions many companies enjoyed in the interconnect industry's infancy.

AT&T-IS

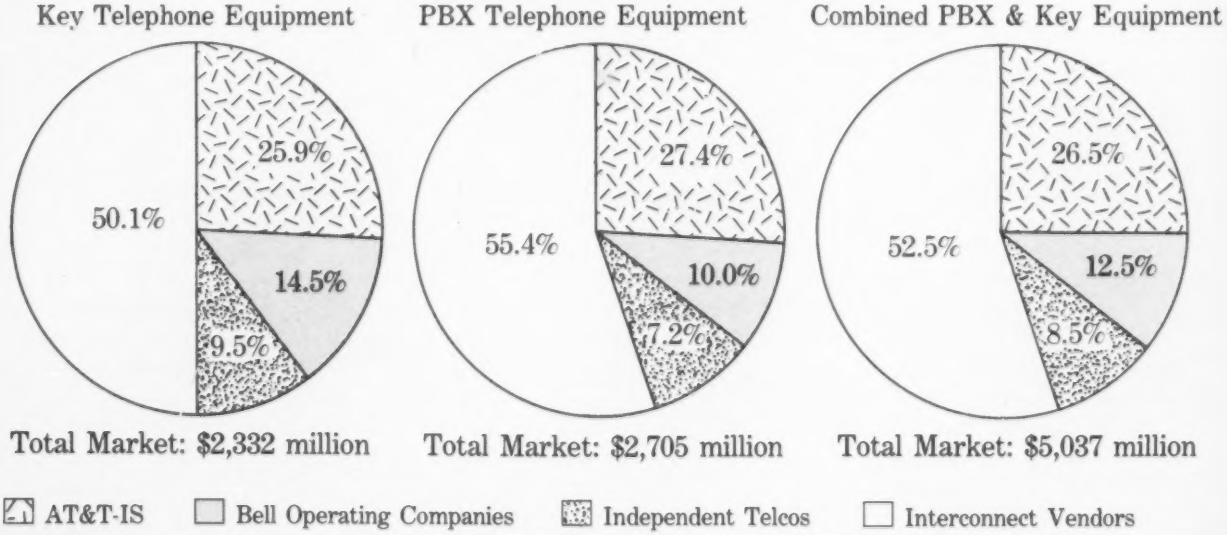
As expected, 1984 and the first half of 1985 represented a period of retrenchment for AT&T, as it developed a market strategy for its new subsidiary, AT&T-IS; stabilized its hold on existing customers; and introduced new CPE systems to flesh out its product line. AT&T was generally successful in all three of these endeavors. The firm stemmed erosion of its installed base, and began to field a completely revamped product line that effectively covered the market from very small key systems up to the No. 5 ESS central office switch in PBX applications.

Having completed the transition from regulated near monopoly to unregulated CPE competitor, AT&T-IS can anticipate a period of sustained growth. AT&T-IS's share of total PBX and key sales remained relatively stable from 1983 to 1984, going from about 26.4 percent to an estimated 26.6 percent. However, its market share is projected to jump to around 29.9 percent in 1985. It also is expected to expand its share steadily throughout the projected period to an estimated 32.3 percent in 1989.

Bell Operating Companies and Centrex

Despite a slow start in the first half of 1984, the BOCs did quite well for competitive newcomers, cornering an estimated 12.5 percent of combined PBX and key sales. The BOCs' primary market strength was their ability to play off their association with the old Bell System and its reputation for service. This strategy was particularly effective with customers who felt overwhelmed by their heightened post-divestiture responsibility for managing their own telecommunications operations. Several BOCs established joint marketing arrangements with their unregulated CPE subsidiaries to fully exploit these customer insecurities, and were able to develop a "one-stop shopping" approach for consumers anxious to leave the management of their communications needs to the local telco.

1984 CPE SALES BY VENDOR CATEGORY



The resurgence in Centrex services (noted in last year's review) has continued, with the BOCs making particularly strong inroads among smaller customers (under 60 lines). The installed base of Bell Centrex-CO* stations is projected to grow at an annual rate of about 4.6 percent through 1989, while Centrex-CU** installations will continue to decline and growth rates for the independent carriers are expected to remain flat. The most significant appeals of Centrex are customarily the lower price structure BOCs have developed for it relative to comparable CPE offerings and its management by the telco—issues now under attack in a variety of regulatory forums.

Summary of NATA Findings

CPE markets saw strong, though uneven, growth in 1984. The key market experienced an unexpected surge of activity, with volume shipments and sales up an estimated 26.6 percent over 1983. The PBX market grew by a healthy 6.7 percent over 1983. The interconnect industry, despite higher volume sales in key equipment, experienced a 17-percent drop in total sales revenues in 1984 because of lower PBX sales and continued price erosion in both markets.

The following summarizes NATA's projections for the end-user CPE market and interconnect (non-AT&T-IS, non-BOC) industry development over the coming five years:

- Installed base growth of stand-alone key telephone stations will average 4.5 percent between 1985 and 1989, compared to a 4.4 percent average annual growth between 1980 and 1984.

- Interconnect's share of the key base will peak at around 32 percent in 1987, after which it will remain relatively stable. Annual growth in the interconnect installed base of key equipment will average 8.9 percent between 1985 and 1989, down from an average annual growth rate of 38.4 percent between 1980 and 1984.

- Installed base growth of combined PBX-Centrex telephone stations will average 4.6 percent between 1985 and 1989, up from 4.3 percent between 1980 and 1984. PBX growth will average 5.2 percent between 1985 and 1989, compared to an average annual rate of 7.0 percent between 1980 and 1984. Centrex stations will grow at an average annual rate of 2.8 percent through 1989, compared to an average annual decrease of 1.5 percent between 1980 and 1984.

- Interconnect's share of the PBX market will peak at about 43 percent in 1987, after which it is expected to decline marginally. Annual growth in the interconnect installed base of PBX equipment will average 5.4 percent between 1985 and 1989, down from an average annual growth rate of 20.8 percent between 1980 and 1984.

- Annual interconnect revenues from equipment sales to end users will decline slowly but steadily between 1985 and 1989, as a result of the interconnect industry's declining market share and general CPE price erosion. Revenues from service offerings and other sources will mount steadily, accounting for almost 40 percent of total interconnect revenues by 1989. Total interconnect revenues will decline marginally in 1985 and 1986, after which they will show a small annual increase.

The following summarizes NATA's projections for CPE manufacturers' shipments over the next five years:

- Total shipments of key equipment will remain relatively flat through 1989, because of manufacturers' overproduction in 1984 and the resulting product glut. Non-AT&T manufacturers' share of total key shipments will decline from about 71 percent in 1985 to an estimated 67 percent in 1989.

- Total PBX shipments will grow by an average 4.2 percent between 1985 and 1989, down from an average growth of 7.1 percent between 1980 and 1984. Non-AT&T manufacturers' share of total PBX shipments will remain stable at about 69 percent.

*With Centrex CO, the local telco dedicates a number of lines and a portion of its central office switching equipment to a particular customer.

**With Centrex CU, the local telco locates special switching equipment on a customer's premises.

KEY SYSTEM MARKET

Installed Base and End-User Sales

Update

Two significant revisions have been made this year to NATA's estimates of the key system market. First, the independent telephone companies' estimated installed base of key telephone equipment has been reduced by about 40 percent from previous years' estimates. This correction resulted in a lower-than-estimated total stand-alone key telephone base (by about 7 percent) and a marginal increase in historical and projected growth rates. The second revision was in the estimated 1983 market segment distribution of the stand-alone key installed base. The revised figures show slightly greater erosion of the BOC base, marginally smaller interconnect growth, and a much higher estimate for AT&T than did last year's estimates. Projected installed-base growth rates have been raised somewhat from last year's levels, reflecting the lower adjusted base and the success of recent aggressive marketing campaigns aimed at very small (one- and two-line) business users.

Overview

The stand-alone key installed base grew by an estimated 4.2 percent in 1984, and growth is projected to average 4.5 percent through the period ending in 1989, a rate close to the 4.4 percent average growth seen between 1980 and 1984. The interconnect base grew by 34.9 percent in 1984 but is expected to average only about 8.9 percent for the rest of the decade, down sharply from the average 38.4 percent between 1980 and 1984.

An Overcrowded Market

The overcrowding that currently characterizes the CPE industry is most pronounced in the key system market, where financial and technical barriers to entry are lower than in the PBX market. The huge influx of new vendors in 1983 continued through 1984 and 1985. Unfortunately, the perceived opportunities that drew hundreds of start-up companies into the fray turned out to be largely illusory. The deregulation of the CPE market and the divestiture of AT&T, while making a tremendous impact on the structure of the marketplace, did not significantly increase the demand for business telecommunications equipment.

The rush of so many new vendors into the market has intensified already ongoing price wars in the key system sector. Though the resulting low key system price levels found in the market have stimulated some growth, particularly at the very small end of the market, their real impact has been to accelerate replacement rates of existing systems. Consequently, the replacement of older systems in the installed base is all that has allowed many smaller interconnects to survive over the past two years. Replacement rates are expected to remain relatively high through 1989 as new technology is introduced and upgrades are made to the remaining base of electromechanical and aging electronic systems. But such replacement demand will not be enough to sustain the number of vendors presently in the industry.

Interconnect Vendors

Interconnect companies accounted for approximately 50 percent of new key system sales in 1984. Their combined installed base reached 26 percent of the total in 1984 and will continue to grow, though at a declining rate, through 1989. The interconnect industry's installed base share will begin to stabilize as the AT&T base is upgraded to newer equipment and as the BOCs continue to develop effective strategies to gain market share. The interconnect base itself is large enough to provide a stable replacement market. About 10 percent of the interconnect base was upgraded in 1984 and the replacement rate should continue at high levels as the remaining base of 1A2 systems and older electronic models comes due for upgrades. However, the replacement market alone will not support the large number of companies currently competing for such business.

New interconnect growth will stem primarily from continued erosion of the AT&T installed base*, interconnects' expansion into very small line sizes, and their increasing penetration of less-populated secondary

*Principally, the base of older equipment inherited from the BOCs upon diverstiture.

STAND-ALONE KEY TELEPHONE MARKET: 1980—1984
INSTALLED BASE DEVELOPMENT

	1980	1981	1982	1983	1984
Bell Operating Companies					
Stations (000)	12,430	12,636	12,773	11,350	450
% Growth	3.9%	1.7%	1.1%	-11.1%	*
% Share	80.9%	78.9%	76.2%	65.6%	2.5%
Independent Telephone Companies					
Stations (000)	1,694	1,741	1,786	1,833	2,055
% Growth	6.1%	2.8%	2.6%	2.6%	12.1%*
% Share	11.0%	10.9%	10.7%	10.6%	11.4%
AT&T-IS					
Stations (000)				650	10,843
% Growth					*
% Share				3.8%	60.2%
Interconnect					
Stations (000)	1,238	1,635	2,190	3,465	4,673
% Growth	32.9%	32.1%	33.9%	58.2%	34.9%
% Share	8.1%	10.2%	13.1%	20.0%	25.9%
TOTAL					
Stations (000)	15,362	16,012	16,749	17,298	18,021
% Growth	5.9%	4.2%	4.6%	3.3%	4.2%

Source: NATA

*Growth rates for the BOCs and AT&T are not shown for 1984 because of the transfer of the embedded base from the operating companies to AT&T. Growth for the independent telephone companies is artificially inflated in 1984 because of the shift of SNET and CBI into that category.

"Installed base" refers to the cumulative total of equipment in use at the end of each calendar year. The figures for key installed base development and projections include estimates of "stand-alone" installations only. "Stand-alone" refers to key systems connected directly to telephone company central offices, as opposed to systems installed behind a PBX system or Centrex service. Approximately 70

markets traditionally dominated by independent telcos. Competition from the BOCs, while reportedly still weak in most areas, will pick up significantly over the next two years as the telcos adapt to unregulated market conditions.

Interconnect vendors have been selling an increasing amount of equipment for use behind Centrex. Competition from some BOC equipment subsidiaries reportedly has been ineffective in this area. But if the FCC frees the BOCs from their present requirement to market CPE through a separate subsidiary and allows them to market equipment directly with Centrex, this situation will almost certainly change dramatically and independent vendors could find themselves pushed out of this market.

AT&T-IS

AT&T-IS accounted for approximately 26 percent of new key sales in 1984 and controlled 60 percent of the

STAND-ALONE KEY TELEPHONE MARKET: 1985—1989
INSTALLED BASE PROJECTIONS

	1985	1986	1987	1988	1989
Bell Operating Companies					
Stations (000)	967	1,535	2,187	2,885	3,635
% Growth	114.9%	58.7%	42.5%	31.9%	26.0%
% Share	5.2%	7.9%	10.7%	13.5%	16.2%
Independent Telephone Companies					
Stations (000)	2,091	2,121	2,154	2,181	2,205
% Growth	1.8%	1.4%	1.6%	1.3%	1.1%
% Share	11.1%	10.8%	10.5%	10.2%	9.8%
AT&T-IS					
Stations (000)	10,254	9,826	9,573	9,473	9,481
% Growth	−5.4%	−4.2%	−2.6%	−1.0%	0.1%
% Share	54.6%	50.2%	46.8%	44.2%	42.3%
Interconnect					
Stations (000)	5,464	6,097	6,562	6,876	7,108
% Growth	16.9%	11.6%	7.6%	4.8%	3.4%
% Share	29.1%	31.1%	32.0%	32.1%	31.7%
TOTAL					
Stations (000)	18,776	19,579	20,476	21,415	22,429
% Growth	4.2%	4.3%	4.6%	4.6%	4.7%

Source: NATA

percent of all key telephone stations shipped in 1984 are assumed to have been installed as stand alones.

The 22 wholly-owned Bell operating companies (BOCs) were divested by AT&T January 1, 1984, and were regrouped into seven independent regional companies. At the time of divestiture the BOCs' base of approximately 11.4 million stand-alone key telephone stations was transferred to AT&T. Two companies historically counted as part of the Bell System—Southern New England Telephone (SNET) and Cincinnati Bell (CBI)—were not included in the AT&T divestiture and their base was transferred to that category in the 1984 column.

entire installed base of stand-alone key instruments. Though its existing customer base remains the target of aggressive marketing efforts by both BOC and interconnect vendors, AT&T-IS has been remarkably successful in retaining customers and providing the bulk of upgrades itself. Recent reports from within AT&T-IS indicate that the embedded base is seen as an increasingly important revenue source for the company. The firm obviously means to protect its base. AT&T-IS's threatened imposition of "contract termination charges"—penalty assessments on customers wishing to abandon service agreements entered into with the BOCs prior to divestiture—has been especially effective in convincing customers not to switch to competitive equipment offerings.

AT&T-IS's Merlin family of key systems continues to be an extremely popular product offering, and the new EKTS 2600 has filled out the low end of AT&T-IS's line. The AT&T Horizon, despite its age, is proving to be a durable offering and is helping AT&T hold its base until the still-unannounced System 25 is available.

Bell Operating Companies

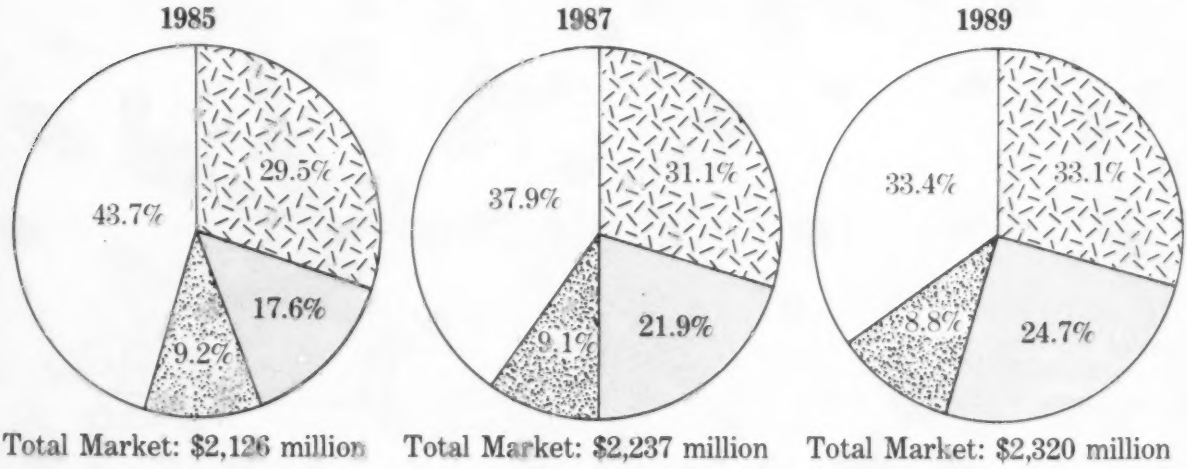
The BOCs accounted for approximately 14.5 percent of key sales in 1984 and are expected to capture at least 25 percent of total sales by 1989—an impressive accomplishment for what are essentially seven start-ups with no experience in competitive markets. Like interconnect distributors and AT&T-IS itself, the BOCs generated the bulk of their business last year from the AT&T-IS base. The vast majority of competitors interviewed for this year's *Review* characterized the BOCs as inexperienced at marketing, particularly with respect to pricing. Although it may take the BOCs another 12 or 18 months to arrive at truly effective CPE marketing strategies, they will almost certainly be successful in the meantime at buying market share through "lowballing." As they gain experience and grow familiar with market conditions, they inevitably will develop sophisticated sales approaches to the market, and by 1987 they are expected to begin making serious inroads into interconnect markets.

Furthermore, the FCC has indicated that it plans soon to review its requirement that the BOCs market CPE only through separate subsidiaries. If the BOCs are in fact allowed to market CPE together with network services, they will gain a nearly unassailable position in equipment markets. Such would pertain particularly to the small business markets, where many customers yearn for the "good old days" of one-stop shopping and telco management of all of their communications needs. Indeed, anecdotal reports indicate that many BOC customers are small- and medium-sized businesses who continue to see the local telco as the most knowledgeable and reliable vendor in the market. The majority of these customers turn to the local BOC equipment subsidiary without ever seeking a competitive bid. It is clear that the unregulated subsidiaries' use of the Bell name and close affiliation with the local telephone company continue to be powerful sales tools in themselves. Most of the unregulated subsidiaries are making full use of these advantages.

Centrex and 1A2 Equipment

The BOCs' equipment subsidiaries have been relatively unsuccessful in marketing CPE for use with Centrex services, and several BOCs (those associated with Bell Atlantic and Pacific Telesis) have asked the FCC for permission to act as prime contractors for the provision of Centrex services and related CPE outside their equipment subsidiaries. As a result of NATA's comments on these proposals, the FCC granted the Bell Atlantic companies' request with the stipulation that only nontelco-affiliated CPE vendors can act as subcontractors. To the

KEY TELEPHONE EQUIPMENT SALES BY VENDOR CATEGORY: 1985-1989



Total Market: $2,126 million Total Market: $2,237 million Total Market: $2,320 million

AT&T-IS Bell Operating Companies Independent Telcos Interconnect Vendors

extent that other BOCs adopt similar programs, independent key vendors' access to the behind-Centrex market will be enhanced.

The remaining base of 1A2 electromechanical key equipment is being replaced at a higher rate than previously projected, with over half of the 1983 base retired by the end of 1985. The recent influx of very inexpensive, moderately featured electronic products has made it increasingly difficult for end users to justify the added cabling and labor expenses associated with electromechanical equipment.

Manufacturers' Key Shipments

Overview

Shipments of key telephone equipment surged to unsustainable heights in 1984, and production levels outstripped market demand. Actual manufacturer shipments in 1984 jumped an estimated 26.6 percent over 1983 figures—to more than 4.2 million stations. Even so, manufacturers and suppliers overestimated demand and were left with a huge inventory overhang—conservatively estimated at some $500 million worth of equipment—at the end of 1984. Shipment levels are projected to decline by at least 4.5 percent in 1985 and remain relatively level for several years after that.

Market Saturation

Production levels of key telephone equipment reached a peak in 1984 as manufacturers—both new and established—vied aggressively for market presence with little regard for actual end-user demand. New manufacturers began flocking to the market in 1983, lured both by the hope of capturing BOCs as distributors and by the perceived opportunity to upgrade the AT&T base. Unfortunately, the market restructuring brought about by the deregulation of equipment markets and the divestiture of AT&T did not really increase aggregate demand for CPE, and total production in 1984 soared far above the market's ability to absorb the equipment.

The product glut sparked a round of price cutting by manufacturers in 1984, allowing vendors to realize somewhat better margins and stepping up already high replacement rates in the installed base. Even with the accelerated replacement, however, many manufacturers closed the year with tremendous inventory backlogs and were forced to slash production levels in 1985.

As a result of 1984's artificial demand, production levels are projected to decline in 1985 and remain relatively stable through 1989. However, even these essentially flat projected shipment levels can be sustained only if customers continue to upgrade their existing systems at a relatively high rate. Replacement is expected to account for approximately 55 percent of total shipments through 1989, with roughly 11 percent of the base turning over annually.

Production of electromechanical (1A2-type) equipment has been hit especially hard by these replacement trends, with shipments slipping precipitously from about 25 percent of total key lines in 1983 to less than 10 percent in 1985.

KEY TELEPHONE MARKET: 1980–1984
ESTIMATED MANUFACTURERS' SHIPMENTS

	1980	1981	1982	1983	1984
AT&T					
Stations (000)	1,635	1,540	1,450	950	1,100
% Share	58.4%	53.1%	47.5%	28.4%	25.9%
Independent Manufacturers					
Stations (000)	1,165	1,360	1,600	2,400	3,140
% Share	41.6%	46.9%	52.5%	71.6%	74.1%
TOTAL					
Stations (000)	2,800	2,900	3,050	3,350	4,240
% Growth	3.3%	3.6%	5.2%	9.8%	26.6%
$ Mill.	$ 826	$ 870	$ 915	$ 921	$1,039

KEY TELEPHONE MARKET: 1985–1989
PROJECTED MANUFACTURERS' SHIPMENTS

	1985	1986	1987	1988	1989
AT&T					
Stations (000)	1,195	1,235	1,275	1,350	1,400
% Share	29.5%	30.4%	31.1%	32.5%	33.2%
Independent Manufacturers					
Stations (000)	2,854	2,822	2,829	2,809	2,819
% Share	70.5%	69.6%	68.9%	67.5%	66.8%
TOTAL					
Stations (000)	4,049	4,057	4,104	4,159	4,219
% Growth	−4.5%	0.2%	1.2%	1.4%	1.5%
$ Mill.	$ 951	$ 953	$1,005	$1,019	$1,125

Source: NATA

These tables show estimated total shipments of key telephone products at the original equipment manufacturers' (OEM) level intended for U.S. markets, including imports. "Independent Manufacturers" refers to all non-AT&T suppliers. Estimated shipments include equipment destined for installation behind PBX systems and Centrex service, as well as those configured as stand-alone sets.

PBX-CENTREX MARKET

Installed Base and End-User Sales

Update

PBX-Centrex projections in this year's *Review* are little different from those contained in last year's, although much of the analysis has been updated to reflect current data. With the benefit of a full year to observe the pattern and scope of the Centrex revival, NATA has been able to revise Centrex numbers marginally downward. NATA has exhaustively recompiled historical data from the original sources (primarily the *Monthly Report No. 7* [MR-7] submitted to the FCC by the BOCs through 1983) and has recomputed projections based on current reports and data from state rate cases. The new analysis foresees an aggregated Centrex growth rate averaging 0.5 percent less than last year's projection, with a correspondingly smaller impact on projected PBX levels. Differences between this year's historical Centrex numbers and those in previous editions result from discrepancies between the MR-7 and sources used previously, from this year's exclusion of Southern New England Telephone and Cincinnati Bell from all Bell System aggregates, and from the breakout of Centrex CU from Centrex CO aggregates. Details from the new analysis are contained in the "Centrex Installed Base Development" tables, pgs. 16–17.

The BOCs' 1984 PBX sales were very close to last year's projections, though their projected growth has been raised to an estimated 26.9 percent annual average. AT&T was more successful than anticipated in stemming erosion from its installed PBX base, and is expected to begin showing average annual growth of about 1.7 percent starting in 1985. The interconnect industry did better than expected in 1984, due largely to smaller-than-expected growth in Centrex. However, overall projections for interconnects point to drastically reduced growth rates and a shrinking share of the installed PBX base after 1987. Interconnects' installed PBX base grew by around 16.3 percent in 1984, but growth should fall to an average of 6.1 percent annually through 1989. Projected growth rates for the independent telcos have been lowered marginally from last year's estimates.

Overview

The combined PBX-Centrex installed base grew by approximately 4.2 percent in 1984 and is expected to grow an average of 4.6 percent annually through 1989. This projection is considerably higher than the estimated 4.0 percent average annual growth in 1980–1984. The projected increase will come from greater overall economic stability, a progressively less chaotic telecommunications market following divestiture, and the introduction of new technology. The PBX installed base grew about 5.7 percent in 1984 and is projected to average about 5.2 percent through 1989. This projection is well below the average 7.0 percent growth between 1980 and 1984, when the number of Centrex stations was declining, but higher than last year's projection for 1985–1989 of roughly 4.5 percent because of lower current projections for Centrex growth. Aggregate Centrex stations are projected to increase by about 2.8 percent annually through 1989, a marked turnaround from the annual average 1.5 percent decline in 1980–1984.

Interconnect Vendors

The interconnect industry experienced healthy expansion in 1984 but faces a period of declining growth and market share through 1989. Its installed PBX base grew by an estimated 16.3 percent in 1984, well above the projected annual average of 5.4 percent through 1989 but considerably below 1982's 24.2 percent. Interconnect's installed base share will peak around 1987, after which it will level off or decline marginally. The base is currently large enough (approximately 42 percent of the total) to generate a continued revenue stream from upgrades, service offerings, and enhancement sales. This revenue stream will help cushion the industry's transition from its early period of dynamic growth to a more stable and mature market phase, but the transition will still engender considerable disruption in both the manufacturing and distribution markets.

The interconnect industry accounted for an estimated 55 percent of new PBX system sales to end users in 1984, down from 1983's record of 66 percent. Interconnect's share of new sales will continue to decline through 1989 and is projected to fall to 47 percent in 1985, 44 percent in 1986, and a low of 36 percent in 1989. Interconnect distributors gained a strong lead in the

market in the years immediately preceding and following the AT&T divestiture, but that lead was short-lived, and the heirs to the Bell System began moving quickly to reclaim their accustomed positions of market dominance. The reemergence of AT&T and the various BOCs as strong competitors, together with the projected revitalization of Centrex services, will leave little room for interconnect sales growth in the late 1980s.

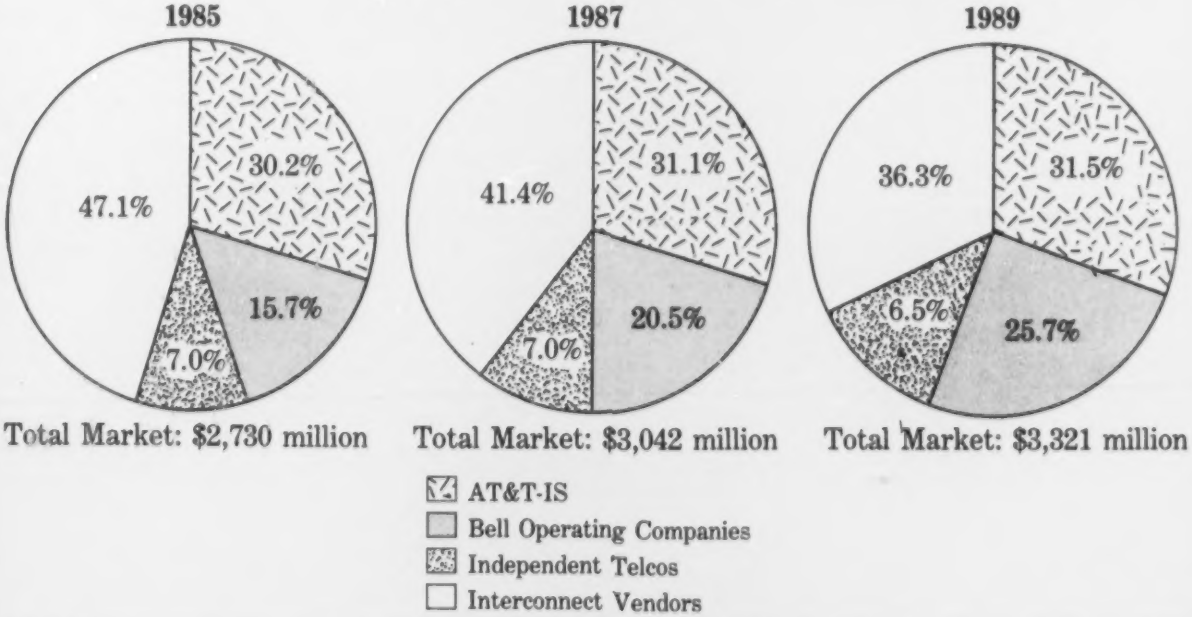
AT&T-IS

Though AT&T-IS continued to lose some installed base in 1984, its losses were lower than in 1983. It seemed to have turned the tide and is expected to begin rebuilding its base in 1985. Its quicker-than-anticipated turnaround on installed-base losses resulted largely from its aggressive policy of threatening former BOC customers with enforcement of so-called contract termination charges, the legality of which has not yet been established in the courts. Since divestiture and the transfer of the BOCs' embedded base, AT&T-IS has come to recognize the tremendous value of this huge base—still over 42 percent of the total—as a source of revenue through sales of service and equipment enhancements.

In sales, AT&T-IS did quite well in 1984 despite its problems in meeting demand for its new PBX switching products (Systems 75 and 85). It accounted for about 27 percent of 1984 industry PBX sales and is expected to do better in 1985, once it releases System 85 enhancements and achieves volume shipments for System 75.

The September 1985 FCC decision lifting the structural separation requirement from AT&T's CPE and long-distance marketing arms will likely boost the company's competitiveness in the very-large-business market. While it could take AT&T most of a year to develop and implement an appropriate marketing strategy to exploit its newly granted flexibility, the company should be making decided inroads among the Fortune 2,000 firms by 1987 and expanding its "systems" approach to other market segments as well. In addition, AT&T's active promotion of used CPE sales by computer brokers, while not yet yielding large volumes, will also help the company bolster its market share, given that AT&T-IS is retaining maintenance and service contracts. AT&T has already made some innovative forays into the very-large-line-size market, the most noteworthy of which is its recent success in selling No. 5 central-office switching systems to large customers as an alternative to Centrex.

PBX TELEPHONE EQUIPMENT SALES BY VENDOR CATEGORY: 1985–1989



Bell Operating Companies

The Bell operating companies did extremely well in their debut in the unregulated CPE market, capturing 10 percent of total PBX sales in 1984 and over 1.5 percent of the installed base. This success is expected to continue, with the BOCs' share of annual PBX sales rising to about 25 percent by 1989 and their installed base share reaching approximately 4 percent. The BOCs have benefited tremendously from their association with the Bell name and their ability to play off the old Bell System's reputation for service. Though the BOCs' unregulated equipment subsidiaries are supposed to be wholly separate entities from the regulated service companies, they have had no trouble selling customers on their affiliation with the telco. In particular, customers overwhelmed or confused by the increased responsibility of managing their telecommunications systems in the post-divestiture environment are often grateful to have the local telco, or a company closely associated with it, offer them "one-stop" solutions to their problems.

Many of the Bell companies have exploited this situation by developing joint-marketing arrangements that allow their equipment subsidiaries to act as sales agents for network services and Centrex. These arrangements have been extremely successful in some areas, generating millions of dollars in commissions to the unregulated subsidiaries for network sales. Unaffiliated vendors participating in these network sales arrangements have earned but a small fraction of the payments collected by the BOCs' own subsidiaries. Vendors are questioning how fairly these programs have been administered, with some competitors charging that the programs provide telcos with opportunities for cross-subsidization.

While some of the new regional Bell companies have launched cross-competitive ventures, opening sales offices in each other's territories, their CPE sales efforts have served primarily to dilute the market for existing vendors. This adds to the market pressure resulting from Centrex's encroachment. Based on the BOCs' first-year track record, one would conclude that for all their successes, these companies view CPE as a secondary product necessary primarily to bolster their flagship Centrex offerings. PBX products are marketed largely to customers who demand direct control over their telecommunications systems and as a stopgap in areas where the BOCs have not yet fully developed upgraded Centrex services.

For customers who demand the direct control over their telecommunications systems afforded by CPE or whose individual requirements cannot be met easily by Centrex, the BOCs will continue to market PBX systems. If—as seems increasingly likely—the FCC grants the BOCs relief from *Computer II* structural separation requirements, as it has recently done for AT&T, the BOCs would attain a nearly impregnable market position. Independent vendors would find themselves faced once again with competitors who can offer integrated packages of network services and equipment products, and for whom only a thin shield of accounting practices prevents cross-subsidization from their regulated local exchange operations. The only difference between this likely scenario and the pre-1983 situation faced by interconnect companies would be that, in an increasingly deregulated market, independent competitors would have fewer avenues of relief from unfair BOC market practices.

Centrex

This year's analysis on the Centrex market reflects a completely new appraisal that NATA undertook in 1985, containing data retabulated from operating company reports to the FCC and the United States Telephone Association (USTA), and projections recomputed in light of recent developments. Though there are some minor discrepancies from last year's Centrex estimates, the new data confirm trends identified in last year's *Review* and offer a more detailed look at components in the Centrex base.

In reversal of a three-year decline, the aggregate base of Centrex stations in 1984—including Centrex-CU—grew by an estimated 0.4 percent. The total base has a projected annual average growth rate of 2.8 percent through 1989, compared to an annual average decline of 1.5 percent between 1980 and 1984. The "Centrex Installed Base Development" tables (pages 16-17) show that the components of the aggregate Centrex base are moving independently of each other. This phenomenon has caused considerable confusion among some market analysts. The base of independent telco Centrex stations will remain essentially flat through the projected period, increasing slightly—after a long period of decline—only in 1986 or 1987. The Centrex-CU portion of the Bell base will decline dramatically—as it has since the late 1970s—almost disappearing by 1989. The Bell base of Centrex-CO stations, on the other hand, has reversed the slow growth and temporary decline it experienced in the late 1970s and early 1980s and is projected to grow at an annual rate of approximately 4.6

PBX-CENTREX MARKET: 1980–1984
INSTALLED BASE DEVELOPMENT

	1980	1981	1982	1983	1984
PBX					
Bell Operating Companies					
Stations (000)	10,106	10,450	10,795	9,825	350
% Growth	2.8%	3.4%	3.3%	−8.9%	*
% Share	60.6%	58.6%	55.7%	47.4%	1.6%
Independent Telephone Companies					
Stations (000)	2,368	2,431	2,410	2,450	2,730
% Growth	2.6%	2.7%	−0.9%	1.7%	11.4%*
% Share	14.2%	13.6%	12.4%	11.8%	12.5%
AT&T-IS					
Stations (000)	N/A	N/A	N/A	800	9,929
% Growth					*
% Share				3.9%	45.3%
Interconnect					
Stations (000)	4,211	4,969	6,173	7,640	8,886
% Growth	21.9%	18.0%	24.2%	23.8%	16.3%
% Share	25.2%	27.8%	31.9%	36.9%	40.6%
TOTAL PBX					
Stations (000)	16,685	17,850	19,378	20,715	21,895
% Growth	7.0%	6.9%	8.6%	6.9%	5.7%
CENTREX					
Stations (000)	8,644	8,495	8,001	7,814	7,846
% Growth	1.9%	−1.7%	−5.8%	−2.3%	0.4%
TOTAL PBX-CENTREX					
Stations (000)	25,329	26,345	27,379	28,529	29,741
% Growth	5.3%	4.0%	3.9%	4.2%	4.2%

Source: NATA

*Growth rates for the BOCs and AT&T-IS are not shown for 1984 because of the transfer of the embedded base from the operating companies to AT&T. Growth for the independent telephone companies is artificially inflated in 1984 because of the shift of SNET and CBI into that category.

"Installed base" refers to the cumulative total of equipment in use at the end of each calendar year. PBX stations are equivalent to equipped lines. Centrex figures include all station equipment, both main stations and extensions, connected behind Centrex service.

PBX-CENTREX MARKET: 1985—1989
INSTALLED BASE PROJECTIONS

	1985	1986	1987	1988	1989
PBX					
Bell Operating Companies					
Stations (000)	571	674	804	943	1,100
% Growth	63.1%	18.0%	19.3%	17.3%	16.7%
% Share	2.5%	2.8%	3.1%	3.5%	3.9%
Independent Telephone Companies					
Stations (000)	2,774	2,818	2,862	2,906	2,951
% Growth	1.6%	1.6%	1.6%	1.5%	1.6%
% Share	12.0%	11.6%	11.2%	10.9%	10.5%
AT&T-IS					
Stations (000)	10,096	10,513	11,009	11,687	12,581
% Growth	1.7%	4.1%	4.7%	6.2%	7.7%
% Share	43.7%	43.2%	43.2%	43.7%	44.7%
Interconnect					
Stations (000)	9,667	10,327	10,826	11,225	11,546
% Growth	8.8%	6.8%	4.8%	3.7%	2.9%
% Share	41.8%	42.4%	42.5%	41.9%	40.9%
TOTAL PBX					
Stations (000)	23,108	24,332	25,501	26,761	28,178
% Growth	5.5%	5.3%	4.8%	4.9%	5.3%
CENTREX					
Stations (000)	7,942	8,115	8,374	8,672	8,991
% Growth	1.2%	2.2%	3.2%	3.6%	3.7%
TOTAL PBX-CENTREX					
Stations (000)	31,050	32,447	33,875	35,433	37,169
% Growth	4.4%	4.5%	4.4%	4.6%	4.9%

Source: NATA

The 22 wholly owned BOCs were divested by AT&T January 1, 1984, and were regrouped into 7 independent regional companies. At the time of divestiture the BOCs' base of approximately 9.8 million PBX stations was transferred to AT&T-IS. Two companies historically counted as part of the Bell System, Southern New England Telephone (SNET) and Cincinnati Bell (CBI), were not included in the AT&T divestiture and their base was transferred to that category in the 1984 column.

ESTIMATED CENTREX INSTALLED BASE DEVELOPMENT: 1980-1984

	1980	1981	1982	1983	1984
BELL OPERATING COMPANIES					
Centrex CO					
Stations (000)	6,439	6,520	6,278	6,406	6,674
% Growth	5.0%	1.3%	-3.7%	2.0%	4.2%
Centrex CU					
Stations (000)	1,480	1,258	1,027	771	554
% Growth	-9.9%	-15.0%	-18.3%	-24.9%	-28.2%
TOTAL BOC					
Stations (000)	7,919	7,778	7,305	7,177	7,228
% Growth	1.9%	-1.8%	-6.1%	-1.8%	-0.7%
INDEPENDENT OPERATING COMPANIES					
Stations (000)	724	717	695	637	618
% Growth	3.1%	-1.1%	-2.9%	-8.4%	-3.0%
TOTAL CENTREX					
Stations (000)	8,644	8,495	8,001	7,814	7,846
% Growth	1.9%	-1.7%	-5.8%	-2.3%	0.4%

Source: FCC, USTA, NATA

Centrex CO refers to the telephone operating companies' central office-based switching service. Centrex CU refers to installations where the telco has placed specialized switching equipment (modified PBX or central office equipment) on the customer's premises.

"Stations" refers to all station equipment, both main stations and extensions, connected behind the Centrex service.

percent through 1989.

The independent telephone operating companies have been slower than their Bell counterparts to exploit their control of Centrex service and are still developing coherent market plans for the service. While these plans will probably begin to bring results around 1986, they probably will not be able to match the Bell companies' high growth rate because the independents' operating territories generally do not contain the same high density of business users as the Bell areas.

The Bell operating companies began repositioning their Centrex-CO service offerings even before divestiture took place, initiating rate "stabilization" plans, beginning development of upgraded feature packages, and restructuring tariffs in order to attract customers smaller than had been the norm prior to divestiture.

The two most attractive features Centrex service offers to small users—with whom it has become very popular—are low price and telco management. In price, Centrex service has become extremely (if not unfairly) competitive relative to comparable CPE offerings in most of the country. This has come through rate reductions, rate stabilization plans, access charge offsets, and tariff reconfigurations. These pricing advantages, combined with the renewed opportunity to let the telephone

PROJECTED CENTREX INSTALLED BASE DEVELOPMENT: 1985–1989

	1985	1986	1987	1988	1989
BELL OPERATING COMPANIES					
Centrex CO					
Stations (000)	6,959	7,272	7,625	7,982	8,335
% Growth	4.3%	4.5%	4.9%	4.7%	4.4%
Centrex CU					
Stations (000)	374	236	139	75	38
% Growth	-32.5%	-36.9%	-41.3%	-45.6%	-50.0%
TOTAL BOC					
Stations (000)	7,333	7,508	7,764	8,057	8,373
% Growth	1.5%	2.4%	3.4%	3.8%	3.9%
INDEPENDENT OPERATING COMPANIES					
Stations (000)	609	607	610	615	618
% Growth	-1.4%	-0.4%	0.5%	0.8%	0.5%
TOTAL CENTREX					
Stations (000)	7,942	8,115	8,374	8,672	8,991
% Growth	1.2%	2.2%	3.2%	3.6%	3.7%

Source: NATA

company manage the office communications system, have proved irresistible for an increasing number of small businesses. The legality of some current pricing mechanisms has been challenged and, as a result, introduces an element of regulatory risk. These risks have so far been largely ignored or discounted by Centrex users.

In the higher-line-size markets the Bell companies continue to lose installed base, but anecdotal evidence strongly indicates they are losing it at a slower rate in 1985 than in 1984. Large Centrex users are the telcos' most eagerly targeted customers, and some operating companies have convinced state regulators to grant significant, temporary rate reductions (up to 25 percent in some cases) for these users until the telco is able to tailor new service offerings to meet the customer's needs. Many of the BOCs have also announced the imminent availability of sophisticated data transmission capabilities and other enhancements for their Centrex customers, in an effort to slow their migration to CPE. There is every reason to believe the telcos will ultimately be able to reverse the current trend among large users away from Centrex.

Manufacturers' PBX Shipments

Update

Aggregate PBX shipment growth rates have been raised slightly from last year's estimates to reflect the new projections for Centrex growth. Dollar projections are lower this year than last due to continued price pressure at the manufacturer level.

AT&T did slightly better than expected, shipping an estimated 955,000 PBX lines in 1984, including an estimated 200,000 lines of Horizon. AT&T accounted for an estimated 27.4 percent of total shipments in 1984, making it—by a slim margin—the largest single PBX manufacturer. Its market share is projected to continue rising, though slowly, and it is expected to remain the largest single supplier in the market for the foreseeable future.

Overview

PBX shipments grew by a healthy 6.7 percent in 1984, well above the annual average of 4.2 percent projected through 1989. Price erosion began to hit manufacturers much harder in 1984 than previously, with average dollars-per-line dropping to around $310 from an estimated $335 in 1983. Price cutting is expected to continue through 1987 as manufacturers attempt to support distributors faced with aggressive price cutting at the end-user level.

Slower Growth

The projected annual average growth rate of 4.2 percent for PBX shipments from 1985 through 1989 is drastically lower than the 7.1 percent average the industry enjoyed between 1980 and 1984, and only about half the rate projected for the industry prior to 1983's Centrex revival. While integrated voice/data PBXs continue to grow as a percentage of total shipments (estimated at 2-3 percent in 1984), end-user demand for those systems does not seem to be materializing as quickly as some analysts projected. Also, manufacturers are developing and shipping an increasing number of modular and software-based enhancements designed to provide existing systems with upgraded data transmission capabilities. Not only have low user-demand for expensive turnkey voice/data switches and the availability of enhancements for existing systems slowed the growth of so-called fourth generation PBX products, they have also resulted in more stable product life cycles than some observers had predicted. Instead of the 4-6 year turnover rate once foreseen by analysts, existing products seem to last a steady 9-11 years.

Hence, slower growth rates, slower-than-expected demand for new technology, and increasingly slim margins have caused oversupply and are contributing to the incipient shake out in the manufacturer market. Several start-up PBX manufacturers have urgently called for additional financing in the past year, and at least one well-established manufacturer has left the market. The current line-up of 40-odd PBX manufacturers in the U.S. market will decline by at least a third, and possibly by a half by 1990, with many of those remaining forced to target specific niches within the market to survive.

PBX MARKET: 1980—1984
ESTIMATED MANUFACTURERS' SHIPMENTS

	1980	1981	1982	1983	1984
AT&T					
Lines (000)	1,200	1,160	1,000	800	955
% Share	45.1%	40.5%	32.5%	24.5%	27.4%
Independent Manufacturers					
Lines (000)	1,460	1,705	2,080	2,470	2,535
% Share	54.9%	59.5%	67.5%	75.5%	72.6%
TOTAL					
Lines (000)	2,660	2,865	3,080	3,270	3,490
% Growth	7.2%	7.7%	7.5%	6.2%	6.7%
$ Mill.	$ 878	$ 955	$1,026	$1,092	$1,082

PBX MARKET: 1985—1989
PROJECTED MANUFACTURERS' SHIPMENTS

	1985	1986	1987	1988	1989
AT&T					
Lines (000)	1,100	1,170	1,220	1,285	1,350
% Share	30.2%	30.9%	31.1%	31.4%	31.5%
Independent Manufacturers					
Lines (000)	2,540	2,610	2,705	2,805	2,935
% Share	69.8	69.1%	68.9%	68.6%	68.5%
TOTAL					
Lines (000)	3,640	3,780	3,925	4,090	4,285
% Growth	4.3%	3.9%	3.8%	4.2%	4.9%
$ Mill.	$1,092	$1,134	$1,177	$1,227	$1,300

Source: NATA

These tables show estimates of total PBX equipment shipments at the original equipment manufacturers' (OEM) level intended for the U.S. market, including imports. "Independent Manufacturers" refers to all non-AT&T suppliers.

INTERCONNECT AND RETAIL MARKETS

Interconnect Sales and Revenue

Update

Estimates for the interconnect industry's sales and revenues have been substantially revised from last year's levels. These revisions follow NATA's comprehensive review of the market after the AT&T divestiture and incorporate adjustments in 1983 installed base estimates and Centrex growth projections. Also, key system sales estimates have been revised to include equipment installed behind Centrex, though estimates for key equipment installed behind PBX systems are still excluded to avoid double counting. Readers should note that while the levels of sales and revenues have been adjusted upward from last year's estimates, the overall declining pattern of projected sales activity reported last year remains the same.

Overview

The pattern of declining interconnect sales and market share outlined in last year's *Review* held fast in 1984 and 1985 as the BOCs and AT&T-IS strove to recapture their traditional dominance of the CPE market. Interconnect's market share will decline over the remainder of the decade, from as high as 53 percent of new CPE sales in 1984 to as low as 35 percent by 1989. The combined market share of AT&T-IS and the BOCs will rise from around 39 percent in 1984 to over 50 percent in 1987, constricting sales growth opportunities for independent equipment dealers.

Declining Sales and Profits

The interconnect industry's overall revenues peaked in 1983 at an estimated $3.9 billion, and interconnect sales of PBX and key equipment accounted for almost 64 percent of the total for these markets. With the BOCs temporarily absent from the CPE markets and AT&T-IS entering competition as essentially a start-up company, independent dealers in 1983 enjoyed a one-time-only dominance in the equipment markets. The short-lived nature of that dominance became apparent in 1984, as AT&T-IS and the BOCs began to regain their traditional dominance in the market. Interconnect's share of the combined PBX-key equipment sales (measured in stations) fell to an estimated 53 percent in 1984 and is projected to continue declining through the end of the decade, hitting a low of around 35 percent by 1989. Revenue from new sales will also decline, from about $2.6 billion in 1984 to just under $2 billion in 1989, although the impact from this decline will be somewhat softened by growing revenues from service and secondary sales. The share of revenues from service and peripheral equipment sales is projected to rise from approximately 28 percent of total revenues in 1984 to almost 40 percent by 1989. Total revenues for the interconnect industry are projected to decline from an estimated $3.6 billion in 1984 to a low of $3.1 billion in 1986, after which they are expected to level out at around $3.2 billion through 1989.

Compounding interconnects' long-term decline in market share are the overcrowding and destructive price competition currently afflicting the vendor market. Over the past two years, the number of companies selling multiline business telephone systems in the United States has increased dramatically. Some observers estimate there are as many as 4,000-5,000 competitors in the market today. While there has always been a high rate of entry and departure from the interconnect market, the AT&T divestiture seems to have unloosed a flood of new companies lured by the promise of more open markets. With no track record on service and no installed base to generate revenue, the majority of these new entrants have resorted to competing on the basis of price alone, in many cases selling equipment at or below cost in order to maintain cash flow. Not surprisingly, these tactics have overturned settled pricing patterns and forced vendors to develop new survival strategies.

The BOCs contributed to the price-cutting frenzy through their initial strategy of building installed base through sizeable markdowns. In addition, recent reports indicate that AT&T-IS, dissatisfied with its 1984 sales levels, has also begun discounting certain product lines. Fortunately, many observers believe this trend has begun to play itself out, and they expect that the majority of marginal competitors will be forced from the market by the end of 1986. Though it is difficult to predict how long the BOCs can continue offering equipment at what are generally considered unprofitable

prices, most analysts suspect that BOC stockholders will not put up with large losses from equipment subsidiaries past 1987.

While overcrowding and price cutting have been worse in the smaller-line-size key market, the PBX market also has felt their effects, with many established vendors currently complaining bitterly about fierce competition among the three or four dominant manufacturers. The result of this price rivalry has been the creation of a "buyer's market" for business telephone equipment.

New Strategies for Survival

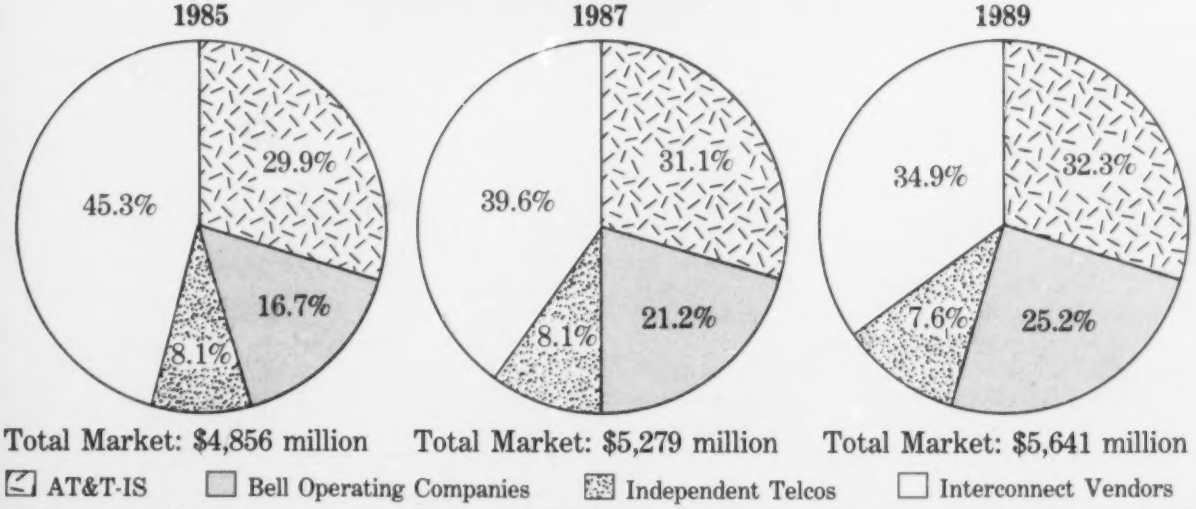
Faced with a shifting market structure and declining profits, established interconnect distributors are having to develop new strategies for survival. The industry's current wave of acquisitions grows out of a widening trend under which better-financed companies are seeking to expand their market penetration and service base by acquiring less-successful competitors. The recent popularity of various types of purchasing and marketing consortia represents a somewhat more imaginative drive by medium-sized vendors to control their business costs. Some group-marketing ventures also offer the advantage of affiliation with a nationally known brand name. Interconnect dealers are adopting such other strategies as emphasizing service offerings and pursuing niches within the market.

Service offerings have been recognized universally as a critical profit center. Interconnect's share of revenues from service and other nonsales sources jumped dramatically this year. Revenue from maintenance, moves and changes, and sales of adjunct equipment to established customers accounted for about 22 percent of total interconnect revenues in 1983, grew to an estimated 28 percent in 1984, and is expected to reach almost 40 percent of total industry revenues by 1989. Pursuit of geographic market niches is expected to bring interconnect companies into greater competition with the independent telephone companies in the less-densely populated secondary markets. Interconnect dealers are also expanding product lines, albeit slowly, into office automation and data processing equipment.

Retrenchment and Consolidation

The trend toward increasingly concentrated market structure noted in 1983 intensified in 1984 and 1985. AT&T and the BOCs accounted for approximately 39 percent of all CPE sales in 1984, and the largest dozen independent vendors probably shared another 30 percent, leaving the remaining thirty percent of sales to be divided among 3,000 to 4,000 companies. Given the improved performance expected from AT&T and the BOCs in 1985, as well as some recent mergers among the very largest interconnects, the top 20 or so largest vendors will probably control over 75 percent of the total market in 1985.

COMBINED PBX & KEY TELEPHONE EQUIPMENT SALES BY VENDOR CATEGORY: 1985–1989



INTERCONNECT INDUSTRY PROJECTED SALES AND REVENUES: 1983–1988

	Stations (000)	Sales ($M)	Other ($M)	Total Revenue ($M)
1983				
PBX	2,147	$1,793		
KTS	1,886	$1,301		
TOTAL		$3,094	$ 873	$3,967
1984				
PBX	1,933	$1,498		
KTS	1,930	$1,061		
TOTAL		$2,559	$ 995	$3,554
1985				
PBX	1,715	$1,286		
KTS	1,613	$ 847		
TOTAL		$2,133	$1,056	$3,189
1986				
PBX	1,675	$1,256		
KTS	1,526	$ 801		
TOTAL		$2,057	$1,109	$3,166
1987				
PBX	1,625	$1,259		
KTS	1,423	$ 776		
TOTAL		$2,035	$1,164	$3,199
1988				
PBX	1,579	$1,224		
KTS	1,343	$ 739		
TOTAL		$1,963	$1,240	$3,203
1989				
PBX	1,556	$1,206		
KTS	1,290	$ 710		
TOTAL		$1,916	$1,302	$3,218

Source: NATA

These figures show annual sales and service revenues for interconnect vendors at the end-user level. They are not cumulative. Figures for key stations and revenues include estimates for stand-alone installations and for equipment installed behind Centrex. Estimates for key equipment installed behind PBX systems are excluded to avoid double counting. "Other" revenues are generated by service offerings, lease revenue, and secondary sales to established customers. Figures represent approximate industry averages, and actual prices per line and revenue ratios vary tremendously from company to company.

Retail Market

After a long period of slow growth, the fledgling retail market for telephone equipment—primarily single-line sets for residential use—was as turbulent in the past three years as the multiline business equipment market. Though the FCC first opened the residential market to customer-owned equipment in 1977, homeowners were slower than businesses were to take advantage of competitive offerings after the business equipment market opened in 1968. Until equipment charges were unbundled from monthly service charges and itemized on bills, consumers had no easy way of knowing how much they were paying for rented telephone sets, and most seemed unaware they had any alternative to the traditional telco-provided instrument. Demand at the retail level remained sluggish until 1982, when press reports on the deregulation of the CPE market and the AT&T divestiture began to apprise the general public of their equipment options. At the same time, AT&T ads started encouraging consumers to purchase their in-place equipment. Responding to these media influences, the public began taking advantage of their equipment options at an astounding rate.

Though the boom of 1983 was phenomenal, with estimated unit sales of telephones and revenues soaring over the previous year's levels, demand cooled off more quickly in 1984 than suppliers had expected. The result was a product glut and price war that shook many companies out of the business and pushed others into associations with better capitalized concerns. When the industry shakeout began to ease up toward the end of 1984, consumers had clearer ideas of what they wanted in a telephone, and surviving companies had sharper strategies on how to sell the instruments.

Presently, consumers appear disenchanted with the least expensive, one-piece and high-glitz decorator phones that were popular in 1983. The public also has been slow to embrace the multifeature, cordless, and cellular sets that have been widely touted as the wave of the future. The industry's current consensus is that consumers are looking for so-called basic phones—those with solid workmanship, few fancy features, and a reasonable price tag. As the industry stabilizes and consolidates over the remainder of the decade, the marketing watchword will be "quality." Consumers will increasingly respond to the name-brand products of a few big companies and will purchase a growing share of their phone equipment from established consumer retail outlets such as Sears and J.C. Penney. For the time being, residential phone retailers have to grapple with the twin problems of product glut and consumer skepticism. The public's post-divestiture rush to switch from rented to purchased phones has slowed considerably, so the future equipment market should lie in replacement sets and phones tailored for new household uses.

RETAIL SALES OF SINGLE-LINE TELEPHONE EQUIPMENT

	Units*		$Value*		Average Price*	
	1984	1985	1984	1985	1984	1985
Telephones	22.6	22.6	$1,138	$1,185	$ 50	$ 52
Basic	8.5	9.6	$ 340	$ 355	$ 40	$ 37
One Piece	4.9	4.1	$ 88	$ 81	$ 18	$ 20
Decorator	1.5	0.3	$ 81	$ 12	$ 54	$ 40
Functional	3.1	3.5	$ 202	$ 224	$ 65	$ 64
Cordless	4.6	5.1	$ 427	$ 513	$ 93	$101
Answerers	2.7	3.3	$ 324	$ 412	$120	$125

*Units and value in millions. Value and pricing at end-user level. 1985 figures are projected.

Source: AT&T Consumer Products

SUBSCRIBER ACCESS LINES BY TYPE OF SERVICE: 1984

	Lines (000)
RBOCs	
Main Telephones	
Residential	64,590.0
Business	17,088.4
PBX Trunks including Centrex	8,221.7
Other Equivalent Main	1,586.9
TOTAL RBOCs	91,487.0
Independent Telephone Companies	
Main Telephones	
Residential	17,983.0
Business	3,039.9
PBX Trunks including Centrex	764.2
Other Equivalent Main	281.9
TOTAL INDEPENDENTS	22,069.0
TOTAL SUBSCRIBER ACCESS LINES	113,556.0

Source: USTA

SUBSCRIBER ACCESS LINES BY STATE: 1984

State or Other Area	TYPE OF ACCESS LINE					TYPE OF CUSTOMER		
	Total	Main	PBX & Centrex	Other Switched	Special	Business	Coin	Residence
Alabama	1,357,562	1,272,921	67,193	15,075	2,373	262,216	21,700	1,073,646
Alaska	10,884	9,473	352	33	1,026	4,370	164	6,350
Arizona	1,441,722	1,303,758	100,702	18,573	18,689	380,410	20,947	1,040,365
Arkansas	777,518	739,603	27,355	10,059	501	160,033	14,889	602,596
California	11,325,281	9,921,149	1,276,462	88,096	39,574	3,633,219	177,944	7,514,118
Colorado	1,650,717	1,488,097	105,481	29,688	27,451	481,561	23,939	1,145,217
Connecticut	1,662,874	1,432,456	123,877	84	106,457	439,838	24,664	1,198,372
Delaware	339,851	274,523	41,920	6,315	17,093	107,444	4,836	227,571
Dist. of Columbia	818,195	402,801	362,211	16,220	36,963	523,070	10,368	284,757
Florida	4,720,249	4,021,965	227,871	460,930	9,483	1,093,376	81,838	3,545,035
Georgia	2,334,587	1,885,374	174,357	271,266	3,590	615,836	39,685	1,679,066
Hawaii	460,831	301,161	158,278	834	558	115,132	6,403	339,296
Idaho	413,354	380,151	25,885	3,874	3,444	99,428	5,492	308,434
Illinois	4,846,694	4,102,558	628,182	11,685	104,269	1,535,606	77,860	3,233,228
Indiana	1,958,627	1,775,417	124,887	37,557	20,766	438,893	30,940	1,488,794
Iowa	892,853	785,537	71,237	20,193	15,886	229,306	14,007	649,540
Kansas	951,680	872,087	64,318	15,275	0	239,885	17,022	694,773
Kentucky	949,919	896,575	40,521	11,262	1,561	173,526	17,257	759,136
Louisiana	1,736,726	1,605,943	106,876	18,757	5,150	373,732	28,695	1,334,299
Maine	450,337	432,419	17,818	0	100	80,520	6,806	363,011
Maryland	2,320,257	1,988,648	256,579	26,970	48,060	674,270	34,958	1,611,029
Massachusetts	3,055,292	2,737,205	310,568	0	7,519	749,188	59,329	2,246,775
Michigan	4,251,520	3,697,126	458,859	41,776	53,759	1,135,424	63,970	3,052,126
Minnesota	1,611,606	1,343,661	212,626	29,449	25,870	480,345	16,342	1,114,919
Mississippi	832,368	788,408	33,309	8,911	1,740	160,474	14,984	656,910
Missouri	1,827,616	1,653,317	145,840	28,459	0	460,940	32,900	1,333,776
Montana	318,336	301,922	10,231	2,898	3,285	72,120	5,684	240,532
Nebraska	460,408	405,019	36,209	10,708	8,472	122,759	6,332	331,215
Nevada	180,507	160,994	18,588	537	388	53,403	3,801	123,303
New Hampshire	461,271	420,922	39,915	0	434	103,932	7,848	349,491
New Jersey	4,173,452	3,649,998	367,844	87,444	68,166	1,169,966	80,109	2,923,377
New Mexico	560,303	514,250	35,440	4,910	5,703	141,184	8,022	411,097
New York	8,677,651	7,693,876	982,702	122	951	2,382,878	152,863	6,141,910
North Carolina	1,505,267	1,177,547	113,110	209,537	5,073	366,020	22,460	1,116,787
North Dakota	246,572	225,022	13,821	4,422	3,307	58,933	3,507	184,132
Ohio	4,176,567	3,728,711	316,825	74,816	56,215	1,004,003	64,012	3,108,552
Oklahoma	1,368,934	1,277,907	72,410	17,971	646	341,902	22,206	1,004,826
Oregon	1,208,674	1,070,933	100,661	18,441	18,639	325,043	16,653	866,978
Pennsylvania	4,804,004	4,002,595	454,153	84,228	263,028	1,441,382	67,553	3,295,069
Rhode Island	453,381	430,839	21,889	0	653	84,918	8,071	360,392
South Carolina	991,581	815,623	64,223	110,343	1,392	222,741	17,760	751,080
South Dakota	238,690	221,361	10,806	3,920	2,603	52,255	3,996	182,439
Tennessee	1,823,658	1,669,918	121,982	26,437	5,321	398,696	28,219	1,396,743
Texas	6,905,192	6,345,022	474,935	77,937	7,298	1,952,047	128,004	4,825,141
Utah	650,029	584,108	47,165	10,503	8,253	174,517	8,670	466,842
Vermont	217,675	206,394	11,256	0	25	45,869	3,869	167,937
Virginia	2,444,814	2,107,553	264,939	28,096	44,226	676,515	37,801	1,730,498
Washington	2,069,556	1,792,770	221,758	27,685	27,343	578,760	26,414	1,464,382
West Virginia	699,279	649,480	35,409	6,340	8,050	135,463	9,415	554,401
Wisconsin	1,534,032	1,324,873	149,903	25,870	33,386	403,103	23,348	1,107,581
Wyoming	225,956	209,189	11,813	2,618	2,336	61,764	4,254	160,040
United States	99,394,909	87,099,159	9,161,551	2,007,124	1,127,075	27,018,215	1,608,810	70,767,884

Preliminary data submitted to the FCC by reporting telephone carriers for the year ended December 31, 1984. Reported figures represent 86.9 percent of total U.S. access lines. Figures include 32,761 mobile access lines.

U.S. BALANCE OF TRADE

U.S. Trade Statistics

The U.S. trade deficit in telephones and telephone switching equipment swelled to over $1.3 billion in 1984, up 275 percent from 1983's erstwhile record deficit of $350 million. Imports grew 92 percent in 1984, while exports dropped 4 percent. Japan enlarged its share of the U.S. import market from roughly one-third in 1983 to a little less than one-half in 1984, with the Far East as a whole supplying four-fifths of U.S. purchases of telephone and telegraph equipment from abroad. The value of shipments from that region grew by 104 percent in 1984, down from a 180 percent increase in 1983. All product categories showed tremendous growth in 1984.

The foreign trade issue in general has become a hot political topic in the United States in 1985, and several protectionist telecommunications trade bills are currently under consideration in Congress. While the goal promoted by most of these bills—enhanced access for U.S. manufacturers to offshore markets—is universally applauded, NATA and other analysts doubt that closing the U.S. market will have that effect. In fact, the most immediate effect of such protectionist moves would be the devastation of those independent CPE vendors in the United States who rely on foreign products. A more prudent approach for the United States, reason many analysts, would be first to address the inflated value of the dollar in world currency markets.

U.S. BALANCE OF TRADE IN TELEPHONE AND TELEPHONE SWITCHING EQUIPMENT: 1984

($000)

	Switching and Switchboard Equipment	Telephone Instruments	Other Telephone Apparatus	TOTAL
Imports				
Japan	$317,337	$242,887	$341,688	$901,912
Canada	165,885	10,463	87,437	263,785
EEC	11,473	3,745	13,741	28,959
Sweden	13,072	306	5,420	18,798
Latin America	6,722	9,302	18,203	34,227
Israel	8,268	128	16,505	24,901
Far East (exc. Japan)	30,319	473,547	168,394	672,260
Other	925	5,000	5,885	11,809
TOTAL	$554,001	$745,378	$657,273	$1,956,651
Exports				
Japan	$ 7,764	$ 3,396	$ 11,454	$ 22,614
Canada	52,028	4,957	34,785	91,770
EEC	114,696	3,115	26,212	144,023
Sweden	647	178	3,892	4,717
Latin America	39,708	8,105	47,608	95,421
Israel	17,435	209	3,180	20,824
Far East (exc. Japan)	124,524	9,074	42,504	176,102
Other	42,432	7,962	37,624	88,018
TOTAL	$399,234	$ 36,996	$207,259	$ 643,489

Source: EIA and U.S. Department of Commerce

GLOSSARY

Access Line—Any circuit from the telephone company's central office to a customer premises. It is also known as the local loop.

AT&T—American Telephone and Telegraph Company. The parent company of AT&T Communications, the largest U.S. long-distance provider (formerly known as Long Lines), and AT&T Technologies, which includes both a manufacturing division (formerly known as Western Electric) and AT&T Information Systems, an unregulated customer premises equipment and enhanced services marketing subsidiary. Prior to its court-ordered divestiture in 1984, AT&T was also the parent of the Bell operating companies.

AT&T Information Systems (AT&T-IS)—The unregulated subsidiary set up by AT&T to market customer premises equipment and enhanced services after January 1, 1983.

Bell Operating Company (BOC)—One of 22 Bell telephone companies whose primary business is providing local telephone service to customers. They are allowed to market, but not manufacture, new equipment.

Business Telephone Instruments—All telephones located on business premises, including single-line installations as well as phone sets associated with Centrex, PBX, and key systems.

Carrier Instruments—Telephone instruments provided by either the BOCs or the more than 1,400 independent telephone companies.

Centrex—A business switching service, provided exclusively by local operating companies using monopoly, central-office switching equipment and outside plant as an alternative to PBX service. There are two generic types of Centrex service:

> **Centrex CO**—A switching service provided directly from the local central-office switching equipment. With Centrex-CO the local telco dedicates a number of lines and a portion of its switching equipment to a particular customer.
>
> **Centrex CU**—A switching service provided by special equipment, such as a modified PBX, that the telco has located on the customer's premises.

Customer Premises Equipment (CPE)—Any apparatus—including telephone handsets, PBX switching equipment, key and hybrid telephone systems, and add-on devices—which is physically located on the customer's property, as opposed to the telephone company's central office.

EKTS—Electronic Key Telephone System.

Electromechanical Equipment—Equipment that incorporates mechanical switches and relays rather than solid-state microprocessor "chips."

Electronic Equipment—Equipment that incorporates solid-state microprocessor "chips" in place of mechanical switches and relays.

Embedded Base—All Bell-supplied equipment in-place on customers' premises as of January 1, 1983. This equipment was transferred from the Bell operating companies to AT&T at the time of divestiture.

EPBX—Electronic Private Branch Exchange.

FCC—Federal Communications Commission. An independent federal agency, authorized by the Communications Act of 1934, responsible for regulating interstate and foreign telecommunications.

Independent Telcos—Any of the approximately 1,400 local telephone operating companies not affiliated with the predivestiture Bell system.

Installed Base—Telephone equipment currently installed and in use.

Interconnect Companies—The approximately 3,000-4,000 nontelco suppliers of business telephone instruments.

Key Telephone System (KTS)—A multiline telephone system designed to provide shared access to several outside lines through buttons, or keys, on the handset, typically offering identified access lines with direct line appearances or terminations on a given station set.

KTS—See Key Telephone System.

LAN—See Local Area Network.

Local Area Network (LAN)—A high-speed data communications system with all aspects of the transmission medium controlled by a network operator. LANs typically permit the user to connect several diverse telecommunications and office equipment functions into an integrated system.

Migration Strategy—AT&T's pricing plan designed to force existing customers to replace their old Bell equipment with new AT&T equipment.

OEM—See Original Equipment Manufacturer.

One-A-2 (1A2)—A generic term referring to an early, sparsely featured, electromechanical key system.

Original Equipment Manufacturer (OEM)—A manufacturer that distributes its product, often on an exclusive basis, through marketing companies who provide the equipment under their own names.

PCA—See Protective Connecting Arrangement.

Private Branch Exchange (PBX)—A private telephone switching system located on a customer's premises. Both PBX and hybrid PBX systems provide pooled access to a group of access lines typically by dialing "9" from an internal station set.

Protective Connecting Arrangement (PCA)—A device leased from the telephone company as an interface between customer-provided equipment and the public telephone network. PCAs were required by telephone companies during the period between the *Carterfone* decision and the establishment of the FCC's Registration Program. The monthly lease charges for PCAs effectively constituted an economic barrier to customers' providing their own equipment.

RBOCs—See Regional Bell Operating Company.

Regional Bell Operating Company (RBOC) or Regional Holding Company (RHC)—One of seven firms created from the AT&T divestiture, each of which acts as a holding company within a region of the United States for one or more of the 22 divested Bell operating companies, as well as for their unregulated subsidiaries.

Registration Program—An FCC program that permits the direct connection of terminal equipment, whether customer-provided or telco-provided, to the public telephone network without the need for protective connecting arrangements. The technical standards for direct connection are contained in Part 68 of the FCC's Rules and Regulations.

Resale—Long-distance service offered by a company that leases its transmission facilities from another carrier.

Retail Market—The distribution channel—comprising such outlets as department stores, mail order catalogs, and household electronic shops—through which single-line telephones and key telephone systems are commonly marketed.

RHC—See Regional Bell Operating Company.

Single-Line Installation—A business telephone instrument providing direct access to the telephone network and not connected to a Centrex, PBX, or key system.

Stand-Alone—A key system directly connected to the telephone network, as opposed to one connected to a PBX or Centrex system.

Station—A telephone set connected directly to an outside line or an internal PBX line with its own discrete number. This study measures stations roughly in terms of lines actually in use, not in terms of a system's capacity.

Stored-Program Control—A type of switching system in which all system operations and features are controlled by computer programs.

Systems—An entire PBX, key, or Centrex installation, including all individual telephone instruments, wire, cable, and common equipment (such as the switch for PBX and the main distribution frame for a key telephone system).

Telco—A common abbreviation for a local telephone operating company.

Telephone Operating Company—A regulated company whose primary business is providing local telephone service to customers.